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ALL RECORDINGS are timed and audited for both musical and acoustical quality before they are entered in WUOM files. See Marjorie Lundin's story on music programming at the University of Michigan, page 14.

ON THE COVER, 10-year-old Kirk Jordan sings Amahl in NBC-TV's presentation of Gian Carlo Menotti's opera, "Amahl and the Night Visitors."



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Here Is Low - Power TV

Education may benefit greatly from the 'package' TV station

- THE LONG-AWAITED breakthrough for educational TV may be just around the corner following the recent announcement of a new electronic development, the low-power "package" television station which may bring the cost of educational TV well within the budgetary reach of hundreds of school districts and educational institutions.

Educational broadcasters of some years' experience will recall the stimulating effect of the FCC's order of September, 1948, which authorized the 10-watt classification of educational FM broadcast stations. Previous to this time, the number of standard FM stations on educational channels had been disappointingly small with fewer than 25 stations actually on the air. Immediately after the authorization of the low-power category of station, however, there was a substantial up-swing in the number of applications filed with the Commission for new stations, the average cost of which

was estimated at between two and three thousand dollars.

Since a recent check with the FCC reveals that there are now 141 educational FM broadcast stations authorized and 126 actually on the air, there is little doubt that the resulting economies in construction and operation from the low-power approach have brought educational

By ROGER J. HOUGLUM

*Manager, Station KRVM,
Eugene, Oregon.*

radio programs to many communities which ordinarily would be denied this service because of local inability to finance a full-power station.

A similar situation prevails today in a field of educational television, and the present utilization of the 242 channels reserved for educa-

tional institutions is a matter of real concern. This is particularly true with regard to the 80 VHF channels, as yet largely untenanted, which are being eyed covetously by commercial telecasters.

Information supplied by the FCC reveals that as of October, 1956, there were 21 educational TV stations actually on the air with another 22 stations authorized. Further study reveals that the licensees of these stations are largely wealthy metropolitan school districts or heavily-endowed universities and colleges. Apparently the initial cost of a standard television station is well beyond the means of the typical school district or educational institution, the capital outlay figure for construction of a new station most frequently mentioned in the JOURNAL being \$200,000.

● WITHIN THE last few months new developments within the electronic industry, based on FCC approval of TV stations of 100-watts minimum power, have brought about sweeping changes in our concept of the costs of installing and operating an educational TV station; and it is now possible to put a new station on the air for a figure directly comparable to the cost of a fully-equipped classroom in a modern school building.

Many well-known manufacturers of radio and electronic equipment, taking advantage of economics resulting from new production line techniques, standardization of equipment design, and volume sales, are currently offering all the basic

facilities for a new 100-watt TV station for a "package price" of approximately \$35,000.

This, admittedly, would be a minimal installation, but would include an approved-type transmitter, approved-type monitor, coaxial transmission line, and antenna. No antenna tower is normally supplied since a small supporting structure on the roof of a tall building would be adequate in most cases.

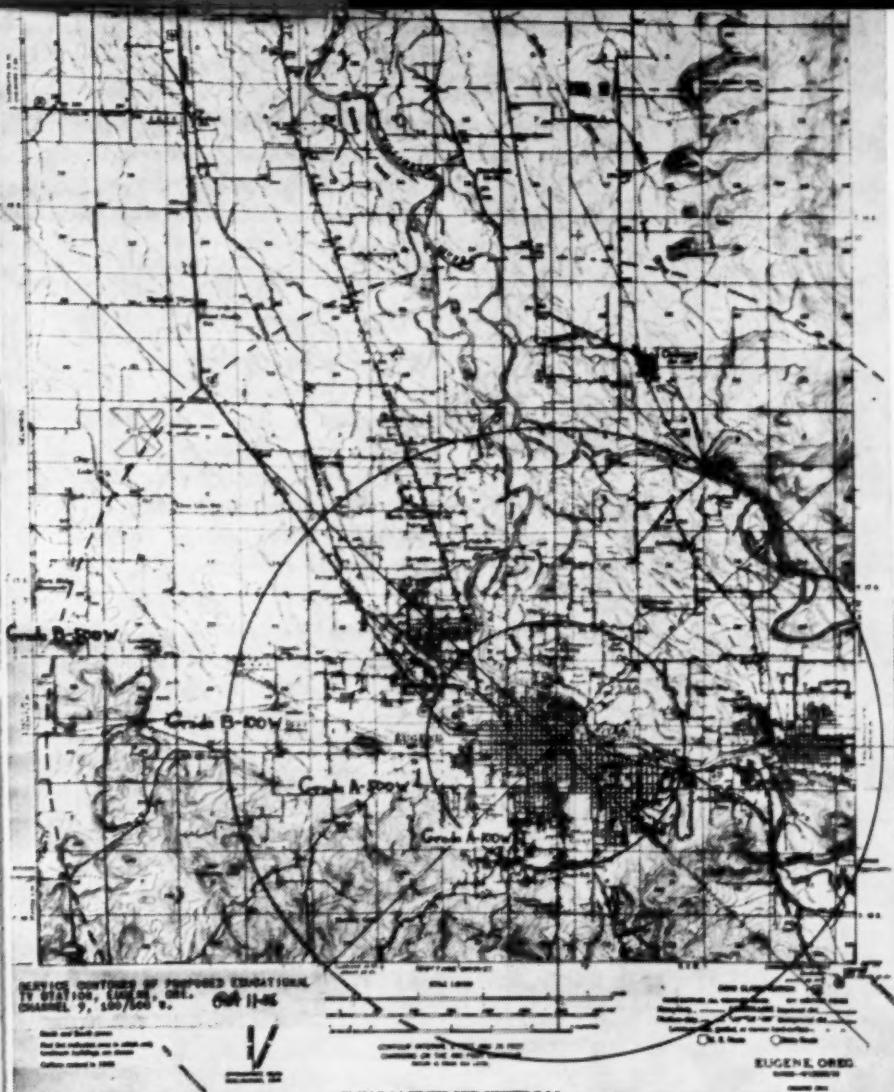
Studio equipment would include a vidicon camera and film chain, synchronizing generator, microphones, an audio console, a turntable for records and transcriptions, projectors for 16 mm. monochrome film and 35 mm. slides, a video monitor, and video switching equipment. Some firms even include basic lighting equipment and film editing facilities within this \$35,000 figure.

Licensees of existing FM stations would be able to use their present microphones, turntables, and audio console, thus reducing the required capital outlay by at least \$2,500. Institutions already having a camera chain in operation could, by the purchase of a transmitter, monitor,

It is most important that education stake its claims to invaluable TV channels.

transmission line, and antenna, get on the air with a complete TV station for a total outlay of \$15,000, or less.

One reason for the greatly lowered cost of the studio equipment specified compared with that



SERVICE CONTOURS of a proposed educational television station in Eugene, Oregon, of 100 watts power and of 500 watts power. (Channel 9). Reading from the transmitting antenna (center point of circle) the service contours are:

- Grade A Service (100 watts). Solid line
- Grade A Service (500 watts). Broken line
- Grade B Service (100 watts). Solid line
- Grade B Service (500 watts). Broken line

of a year or so ago is the use of vidicon tubes in both the camera and film chain. A comparatively new development, vidicon tubes are considerably less expensive to purchase and operate than either the iconoscope or image orthicon types, and are also less subject to damage by inexperienced operators. They have an excellent gray range from white to black, and are capable of sharp, crisp pictures with fine detail.

Apparently the initial cost of a standard TV station has been beyond the means of the typical school district.

They do, however, require a somewhat greater level of light intensity for proper operation. The educational telecaster may meet this problem simply by concentrating his efforts on relatively small sets where the required light intensity is readily obtained, and avoiding large studio productions until such time as he is financially able to purchase additional lighting equipment.

The advantages of such a low-power approach to educational television are entirely obvious. Many educational agencies can immediately construct such a station, organize and train a staff, and at the same time provide a new educational television service for their community. When additional funds can be spared, the present transmitter can be used to drive a high-power amplifier stage for increased

power output with a substantial resultant increase in station coverage. Most important of all, the reserved channel for that community will be in use, insuring its permanent allocation to education.

• **HOWEVER, BEFORE we completely embrace the idea of low-power TV, it would be wise to examine critically just what it can accomplish for education. More specifically, how large a "classroom," or viewing audience, will it satisfactorily serve? Only when we have compiled this information are we in a position to justify the expenditure of public funds for a new station.**

Taking Eugene, Oregon, as a typical potential community for educational television since it already has two educational FM broadcast stations, KRVN and KWAX, with many years of successful operation, it was decided to undertake a preliminary engineering study of the coverage to be obtained with a station of 100 watts effective radiated power(ERP), and with an effective antenna height of 100 feet, opera-

It is now possible to have a station for the cost of a fully-equipped classroom in a modern school building.

ting on the local educational allocation, Channel 9.

Using propagation data based on

FCC engineering tables and available in a readily usable form in a monograph by C. M. Braum, Engineering Consultant for the Joint Council on Educational Television, titled "*Low Cost Educational Stations*," the limits of the various service contours were determined.

The service contours were then traced on two maps, the topographic map of the Eugene quadrangle and the minor civil subdivisions map of the same area. This is the same procedure required by the FCC in preparing engineering exhibits for an application for construction permit for a new station.

To determine the effect on coverage of a sizeable increase in power, similar service contours were drawn on the same maps, assuming an effective radiated power of 500 watts.

Using data from the 1950 census, the population within each service contour was then determined on a precinct by precinct basis.

Referring to the service contours on the topographic map, it will be noted that with 100 watts of effective radiated power the Grade A contour extends to a radius of 2 miles from the transmitter, and the Grade B contour to a radius of 5 miles. Increasing the effective radiated power to 500 watts increases the radius of the Grade A contour to 3.2 miles, and that of the Grade B contour to 7.7 miles. It can be safely assumed that any viewer within the limits of the Grade B contours will receive very acceptable service.

Also, since the FCC propagation data were compiled several years



Roger J. Hougum

ago when TV receivers were far less sensitive and stable than they are today, there is every reason to believe that there will be a substantial number of viewers receiving satisfactory service well beyond the limits of the Grade B contour, particularly if they have a modern receiver and an effective antenna.

● AT PRESENT, there is no specific information available as to the additional cost of increasing the effective radiated power from 100 to 500 watts. This could be accomplished either by installing a

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Book Reviews

CLOSED CIRCUIT AND INDUSTRIAL TELEVISION by Edward M. Noll. Published (1956) by the MacMillan Company, 60 Fifth Avenue, New York 11, N. Y. 227 pages plus 3-page index, illustrated 6x9 \$4.95 paper bound.

• THIS BOOK is primarily a technical book. Its purpose is to "present information about closed circuit television systems available and to suggest some of the ways in which such systems can serve modern needs." In the opening chapter, the author describes a number of services which are already being performed by closed circuit television and describes many practical examples. To those who contemplate the use of closed circuit television in a business or industrial plant, we suggest that this first chapter is required reading.

Perhaps it might be well to quote a definition from the book. "Closed circuit television is simpler and less expensive than broadcast television, since it consists basically only of a camera, a power supply, a pulse generator, and a viewer. Since the signal in closed circuit systems is ordinarily carried from the camera to the viewer by wire, several complicated and costly steps of broadcast television are avoided."

The remainder of the book is quite technical and is primarily for engineers or technicians only. The

basic systems of picture transmission are described, beginning with the principles and capabilities of the system. The scanning process is covered in detail followed by a full treatment of camera tubes and circuits. The author covers fully the characteristics of the vidicon, the electrostatic iconoscope, the image dissector, and the vericon which are used by various manufacturers of closed circuit industrial television equipment.

• VIDEO amplifier systems are next treated with methods employed for high and low frequency compensation, and phase correction. The use of the cathode follower, high peaker, D-C reinsertion and brightness control are covered. The theory and operation of the synchronizing generator is fully explained with features of the operation of interlaced and non interlaced generators outlined and presented in detail. The operation of the RCA interlaced sync generator for use with the Vidicon camera tube is given in detail including schematics. Its vertical and hori-

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Shouldn't Teachers Be Consistent?

- SHOULD NOT teachers, to be consistent, recognize the power of radio and television by doing everything possible to make these media of maximum educational effectiveness?

Advertisers, we know, spend millions of dollars on radio and television programs because there is evidence to prove that programs can be produced which will secure, from home listeners and viewers, favorable reactions toward products or services, with a consequent increase in the income of the advertisers.

Teachers, parents, child development experts, psychologists, and psychiatrists constantly complain about the bad effects which certain types of programs have on children. They urge that something be done to delete the undesirable elements or to discontinue such programs. These undesirable effects, it should be pointed out, have been clearly demonstrated.

It thus appears that there is common agreement from both sides of the camera and microphone that broadcasting can and does affect listeners and viewers. Are we teachers, with such facts before us, going to be consistent? Or will we be guilty of the dubious logic

of the late Mayor James J. Walker of New York who is said to have opposed censorship on the ground that no girl was ever ruined by a book, without realizing that to believe this was to imply that no girl was ever helped by a book?

Of course radio and television do affect individuals, either for bad or good, depending on the program. Our whole system of education at all levels is based on the well-established theory that environment does make a difference—that individuals are affected by what they see, hear, and do.

- WHAT OBLIGATIONS do teachers then have if they are to be consistent?

- 1) They should utilize existing radio and television programs, from whatever source, which have promise of making teaching more effective.
- 2) They should assist in every practicable way to bring about the early construction and operation of educational television and radio stations in areas not presently served by such stations.
- 3) They should assist, whenever they can, in the production of educational programs, especially for

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Interest supplants panic.

TEACHERS LOOK AGAIN

● IN A SHORT, amazing decade, the teacher's attitude toward commercial TV has changed dramatically from panic, to fear, to respect, to eager interest. What is behind this amazing switch in values?

First, Davy Crockett gave us an idea. If one TV hero could clean out a single library shelf, why couldn't we anticipate reading interests generated by all kinds of TV programs? Librarians quietly began to print lists of books based on TV schedules. And this fall, *Elementary English*, the official grade school journal of the National Council of Teachers of English, began a special department, "Wide, Wide Worlds: The Popular Arts in the Classroom." The Women's National Book Association in New York is preparing book lists based on new programs that we have a hunch will interest children: "Circus Boy," "Sir Launcelot," "Buccaneer," and the Danny Kaye-Ed Murrow show on UNICEF are our first guesses. These monthly book lists, accompanied by descriptions of the programs and suggestions for

their use in the classroom, will make it possible for elementary teachers throughout the nation to build "Popular Arts Libraries" in their schools. Children can go to them to find out more about ideas presented on "Mr. Wizard," "Let's Take a Trip," or one of the adventure series.

If the grade-school teacher figures she can make commercial TV work her side of the street, the high-school teacher has already decided that TV drama is the biggest shot in the arm for teaching literature

By **PATRICK D. HAZARD**

Professor of English, State Teachers College, Trenton, New Jersey.

in a generation. More of us than would dare admit it have shuddered to think how many students have been soured forever on the mature excitement of Shakespeare by our necessarily limited presentation of the Bard through print. It's rough enough for teenagers to try to fol-

AT COMMERCIAL TV

Why have attitudes changed?

low the story in the "foreign language" of Elizabethan English; to expect them to derive pleasure from the subtleties of character and motive is impossibly remote—until they can *see* the play. I shall never forget the difference that Maurice Evans and "The Hallmark Hall of Fame" made in my teaching of *Macbeth* to high school seniors. The year before the telecast I had to spend considerable time trying to indicate simply what happened; the Evans production enabled me to proceed at once to a discussion of the play as a work of art.

TV drama in general has an enormous potential for teaching literature. For everybody can now be a first-nighter. TV has *destroyed* the dramatic hinterland. Main Street, actually Side-Street, USA., has become the Great White Way. Sensing this trend, *Scholastic Magazine* began two years ago to print a weekly schedule of TV programs with educational value. Last year, *Scholastic Teacher*, a teachers' professional magazine, started a series of "Teleguides," which give a teacher enough information about

a drama or a documentary to enable him to assign it for class credit. "Cyrano," "The Devil's Disciple," "The Corn is Green," and "The Taming of the Shrew" were among the choices.

• LAST MARCH, *The English Journal*, NCTE magazine for high-school teachers, revealed its awareness of the potential of commercial TV by printing a study guide for Olivier's *Richard III*, prepared by Frank and Audrey Hodgins of the English Department at the University of Maryland. Teacher response to this was so good that the *Journal* has started a regular monthly feature, "The Public Arts," designed to help English teachers make the most of the mass media whenever their content is relevant. A study-guide for Shaw's *Man and Superman* (Hallmark, November 25) appeared in a November issue. Plans are under way for a "Shaw Festival" to be held in the nation's literature classrooms the week before the telecast. This would be a kind of "educational spectacular" dramatizing the im-

portance of Shaw as a writer.

Clearing House, a national magazine for junior and senior high-school teachers, published by Fairleigh Dickinson University, Teaneck, New Jersey, began a department, "TV and the Newer Media," last February. Edited by Henry B. Maloney and Myles Platt, Detroit high-school teachers, it has featured material on "High Tor," "Moby Dick," "The Importance of Being Earnest," and Paddy Chayefsky. In the next issue, there will be discussions of "Born Yesterday" Project 20's documentary on World War I, and Ballantine's new paperback anthology of first-rate TV plays. This inexpensive (35c) anthology makes it possible for high-school students to appreciate contemporary as easily

as traditional excellence. (The book is a November selection of the Teen Age Book Club.) English teachers feel strongly that they have an obligation to honest young writers like

For the high school literature teacher, TV drama is the biggest shot in the arm in a generation.

Robert Alan Arthur, J. P. Miller, and Reginald Rose as well as to Shakespeare and Shaw. It's silly to cheer about literature of value in the seventeenth century when one is silent about important creativity coming into our own living rooms. In fact, we probably need to pay *more* attention to those writers creating today: the old standards will survive; the good TV playwright can get lost in the Trendex shuffle.

● THIS IS HOW TV helps us do better what we've been trying to do all along. But the electronic box in the front room is doing much more than that: it is introducing *all* people to *all* the arts. Think of the millions who saw their first opera, their first ballet, their first concert music on TV. "Omnibus" has put jazz buffs



CHARLES COLLINGWOOD and wife look for possible CBS "Odyssey" material in Mexico's Acolman Monastery built in 1580. The program will examine man's experience throughout history.

forever in its debt by Leonard Bernstein's inspired explanation of his own love for America's unique contribution to musical culture. Agnes DeMille narrated a superb introduc-

Teachers have become so busy making use of outstanding material on TV that we have little time or inclination to gripe about the rest.

tion to ballet on the same series. "Camera Three" has explored the work of painters like Toulouse Lautrec and Goya and given another nice push to jazz appreciation with its recent Gerry Mulligan-chamber music session. The magazine concept shows interview creative people like Robert Frost, Frank Lloyd Wright, and Ben Shahn, taking the hex off "Culture" by showing that artists are human. Now that Robert Herridge has graduated from sustaining shows to night-time drama, teachers can interpret his imaginative theories of orchestrating all the arts in TV drama, as in the dance sequences in his adaptation of Steinbeck's "Flight" and the music in the recent "Ballad of Yermo Red." The English teacher is generally not prepared to range this widely among the arts, but it's a simple matter to assign such programs for themes or oral reports, thus immeasurably enhancing student horizons. Commercial TV, in fact, is way ahead of many educators in its treatment of

the contemporary arts such as jazz, architecture, industrial design, and movies.

It would be a mistake, however, to leave the impression that teachers are completely satisfied with TV. Far from it. We still feel that the trivial and mediocre far outstrip and (outpoint in the ratings) those programs that fire our imaginations. But we have become so busy making use of outstanding material that we have far less time (or inclination) to gripe than before. And we are confident that if we give our students a chance in the classroom to talk about what they see and like (good, bad, and indifferent), they will gradually grow to enjoy the best. We'll assign the best shows because we agree with Professor Edgar Dale that good taste comes from tasting good things. Hamburger after all is dull after a few juicy steaks. And TV, to its credit, is making it possible for the common man to taste the best if he wants to.

Finally, the good teacher knows that conscious choice is the first step toward mature taste. Even a magazine like *TV Guide* is educa-

That electronic box in the front room is introducing all the people to all the arts.

tional in the hands of an imaginative teacher. For when one takes time to decide what to watch, he is
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Radio Music Programming

Philosophy, operational details from a top educational station

● YOU CAN CHAIN a terrier to a desk, and force it to listen to all the symphonies of Beethoven, without changing its opinion one jot as to the relative delights of rat-hunting and classical music; and the same thing is true, in its degree, of mankind. The real point is that most of us, far from being chained to the desk, never get the chance of finding out whether we can appreciate great music or not."

This remark was made by George Bernard Shaw in 1894. Shaw, by the way, was one of the greatest music critics of all times.

His remark is still pertinent in considering programming good music on a radio station. If people are exposed to good music — and even great music — they're more likely to come to like it, naturally, than if they never heard it at all. You might ask why the public should like good music? Why do people like the best of anything: music or art or sculpture or books? Supposedly, an acquaintance with and an appreciation of good art or good music help us in our understanding of life, and especially the spiritual part of our individual lives.

Albert Schweitzer has said: "In every true artistic perception there come into action all the feelings and ideas of which a man is capable."

It seems that once a person ac-

By MARJORIE LUNDIN

Music Director, WUOMWFUM, University of Michigan, Ann Arbor. From a speech to the Wired Radio Conference, University of Michigan.

quires a liking for good music he wants more good music, and he continues to like good music for the rest of his life. Serious music gives him a chance to develop his tastes — in fact, he never exhausts the possibilities of developing himself and his tastes through serious music. In the vast storehouse of great music there can never be a final goal, a point of satiety, or in the greatest of music, a boring banality. Every time you hear a great piece of mu-

sic it's possible to hear something new, something fresh, and, perhaps something inspiring.

We can safely say that good music is *good* for people. It certainly can't do anything but elevate their tastes, if they give it a chance. And this brings us back to G. B. Shaw—that the thing we've got to do is *give* people the *chance* to listen to good music. This, of course, radio is eminently suited to do.

● ON SOME OCCASIONS

when I've been invited to talk on music programming, the host has suggested, with varying degrees of subtlety, that "You don't have to be highbrow." My usual response is "That's all I can be; I can't be anything else."

You see, our broadcasting at the University of Michigan is on a rather high cultural level. We feel that, as an educational station, we must give people the best—the best in dramas, in talk programs, in music, in newscasting, and so on—insofar as we are able to. We entertain a theory that by exposing people to the best, we can perhaps raise their tastes and their understandings and thereby educate them.

We still do a lot of thinking about what we should put on the air. We wonder whether we are giving people what they want, and then, of course, we wonder whether what they want is what they ought to have. We feel we have a responsibility to *stretch* people's ability to understand and to accept new ideas and to develop their tastes. We therefore do not program *down* to

people, but rather, we program *up* to them. There is no condescension on our part (at least not consciously). We expect a lot from our listeners, and they seem to respond favorably.

You will, therefore, hear no give-away quiz programs on our stations, no rock-and-roll, no soap operas. We have very little so-called "popular music," and of course we have no commercials. About 69 per cent of our broadcast day is devoted to good music.

All of these music programs are created in terms of *leading* people rather than in terms of *following* them.

Before I come to setting up good music programs, I'd like to tell you what we know of audience reaction to this concept. We canvassed recently 5,000 listeners on our mailing list. About 30 per cent (incidentally, that's really a phenomenal response) responded. Most (a total of 683 of those who responded) wanted classical and light classical music. The next category, in order of preference, was *drama*, and that had 129

**All our music programs
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votes. This showed us that we have built a receptive audience for good music. At least one listener wrote at the bottom of his questionnaire:



"WUOM has provided the principal spark for my awakening of classical music pleasure and to the background required to acquire a record collection of merit."

Another listener wrote: "I am grateful beyond expression for the privilege of listening to broadcasts of countless priceless recordings of great operatic numbers, symphonies, marches, and overtures." Of course, we had some criticisms, too, but not so very many (and we took them to heart) and we also got some useful and constructive suggestions. The response was overwhelming, however, in approbation of what we are doing.

● WITH THE HOPE that I've convinced you to devote much of your broadcast time to *good* music—how do you go about setting up these music programs?

Seven and a half years ago, when I joined the staff of the Broadcasting Service here, we had no music department. Each announcer programmed his own music, and announced it. No one person was in charge of these operations. The selection of music was somewhat haphazard, as were the remarks said about the music, and, at times, the pronunciation of composers' names. The very first thing for the

A MUSICAL WASHING is hung out by Marjorie Lundin as she salvages the publisher's printed description of each recording for WUOM files.

new music department to do was to see that the information given out was correct, and that names and titles were correctly pronounced. This gave us a start in the right

It is up to us as educational broadcasters to maintain and whenever possible to raise the standards of our programs.

direction, and "cleaned up the operation," so to speak. Next, using the records we had available, we began some *advance* programming of music, trying to present balanced programs of good recordings. And then the music staff began writing the continuity read by the announcers.

Meanwhile, we gradually built up our record collection, and we revised our method of filing the discs and reference cards. We were eventually able to expand the number of music programs, and give our listeners a far wider variety of good music. We also expanded our facilities for broadcasting *live* concerts, from the various recital halls and auditoriums on the campus.

Many schools begin broadcasting on the proverbial shoe-string. How do they begin programming good music? In my estimation, one of the best things is to talk a music-major into helping. Someone majoring in music on your campus would probably be the best-qualified to make recommendations for

the selection of recordings. That person would also know something about the various kinds and styles of music that would make up a good program. And he could advise announcers on the pronunciation of names. Often, the student music director can serve also as the announcer on music programs.

If you can't find a music-major a hi-fi fan might be your next-best choice or, simply, a connois-

Seek people who are enthusiastic and know what they are doing.

scur of good music. At any rate, it's almost imperative in launching a program of serious music to have people who know what they're doing—and who have enthusiasm for the task.

But suppose no qualified person is available? You can still present fine music by using some of the packaged-record programs, such as RCA's "Music You Want" series, or transcription services such as SESAC or RCA's "Thesaurus." In all of these services (and I'm sure there are others) you can get the recordings and a complete, ready-to-use script accompanying each program. Just read the copy (accurately, please!) and spin the records.

- **HOWEVER**, as soon as you can do so, it's well to begin making

your own selections of recordings. There are a number of good books on the market that tell how to build a record library. A particularly valuable guide is the monthly *High Fidelity* magazine, which contains good reviews of all new recordings. Also, the *New York Sunday Times*, the *Saturday Review* and *Time* magazine all have reviews of new recordings.

Before you can make your selections for a music program you will have to time your recordings and you should, of course, audition the discs for musical and acoustical quality.

When you actually sit down to plan your music programs you must decide how you're going to put the selections together. If you have a number of music programs on the air, you can devote each one to a specific category: an all-symphonic program, a program of string quartets, a recital of piano music, and what not. However, if your music time is limited, you might want to offer a sort of variety program. This kind of program, incidentally, is probably best for the beginning listener, too. Usually in

Faulty pronunciation can ruin a music program.

making out a music program, selections are presented in chronological order. If you are programming Bach, Beethoven and Bartok, for example, you would probably play

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Television Goes on Tape

Recording of TV on magnetic tape now has become a bright reality

● ALMOST FOUR YEARS ago the experiments exploring the possibilities of recording television programs on magnetic tape, and its bright promise for the future were reported in these columns. ("Tape for Television," by Philip Lewis, *AERT JOURNAL*, March, 1953). It is a real satisfaction at this time to be able to follow up with a record

By **PHILIP LEWIS**

*Principal, Herman Felsenthal
Elementary School, Chicago,
Illinois.*

of actual and successful implementation of this revolutionary device so that workers in the field can consider the advantages offered by it in their specialized fields.

On June 26, 1956 at Hollywood's CBS Television City, television cameras were focused on members of a conference. A closed-circuit system with viewing monitors allowed the group to see itself on

camera. Simultaneously, the same images were being magnetically impressed on an Ampex Videotape Recorder. Playback of this taped record was intermixed with live pickup reproduction to permit close comparison of their relative fidelity. As a result of these trials and others of a similar nature at later dates, enthusiastic comment was expressed by both technical and management executives over the simplicity of operation and the quality of reproduction of the machine under widely varying lighting and programming conditions.

● **HOW IT WORKS:**—The console model illustrated looks like an overgrown version of the regular audio tape recorder, but incorporates many ingenious innovations. The tape employed has a Mylar base .001 in thickness, is two inches in width, and 12½" reel of this material (4800 ft.) pulled at a speed of 15 inches per second will record or play back 64 minutes of material. The device that makes quality recording possible at this comparatively low tape speed where a re-

sponse of 4,000,000 cycles is required is through the employment of a head that rotates at 14,000 r.p.m. as the tape moves by at 15 inches per second. This head assembly has four small magnetic heads located at 90° intervals about a small rotating disc, and gives an effective tape speed sufficient to record and reproduce all of the video electrical signals in the television picture. The sound that accompanies the television picture is recorded in the same way as on a conventional recorder. The sound track runs along the edge of the magnetic tape and insures that sound and picture are always in perfect synchronization.

Rewind time for the full reel is less than three minutes, and the machine can be stopped in approximately the time it takes for about two inches of tape to be pulled past the head. Picture resolution and detail achieved with the Videotape Recorder is far beyond the capabilities of the average home television receiver, and individual tapes have been rerun as many as 100 times without losing quality.

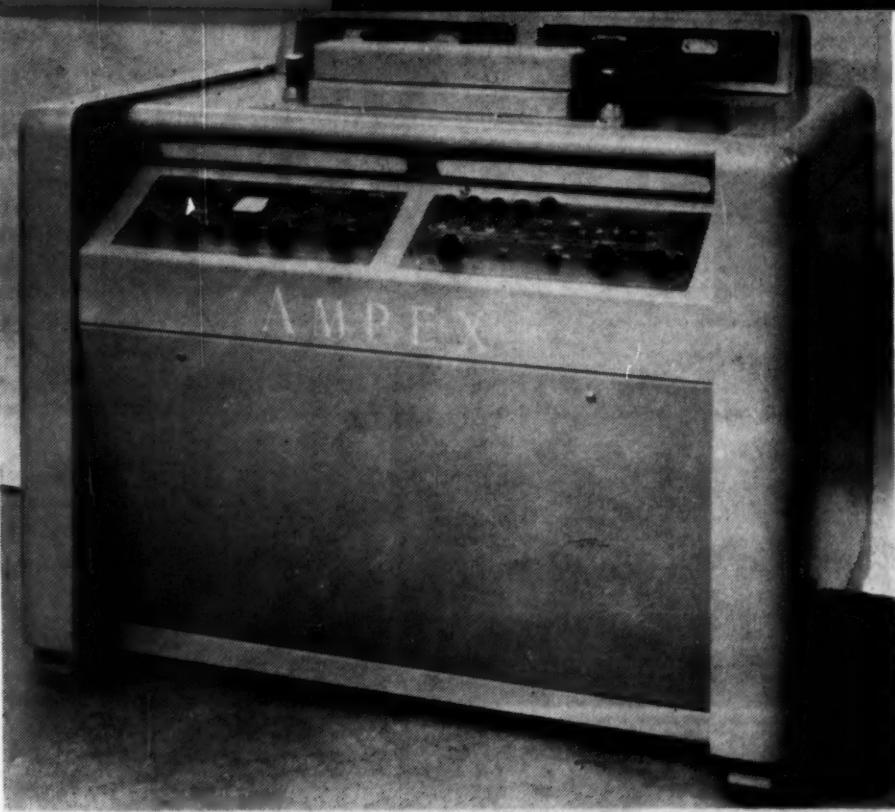
Once the Recorder has been adjusted, operation is a simple matter of pushing a few buttons, and recordings are ready for playback immediately after rewind without any processing involved. Gray scale reproduction characteristics are identical to that obtained with television cameras on a live show, and are superior to results obtained from even the best kinescopes.

● ADVANTAGES FOR THE

TV INDUSTRY:—CBS News film is exploring the possibilities of organizing a national newsreel service that would transmit newsfilm on the coaxial cables connecting their affiliates during off hours when the cables must be kept "hot" anyway. A subscriber to this service would use the Videotape Recorder to store the program for subsequent telecasting according to local programming schedules. This same type of delayed broadcast is being discussed as the answer to the important problem of originating East Coast programs for viewing by West Coast audiences despite the time difference involvement.

The ability to erase the magnetic tape after a delayed program has been played back into the network, and then to reuse the same tape to record a different program is a vital factor in reducing annual costs. Another money-saving application would be to cut production costs by using a single-shift studio crew and recording all live shows on tape during their working hours. The programs could be played back later from the Videotape Recorder to coincide with programming times.

The re-running of finishes of races, K. O.'s in fights, and thrilling climaxes of football and baseball games lend themselves readily to the capabilities of this versatile recorder. Similarly, the Videotape device can be installed in mobile trucks for use with cameras for special events pickups which cannot be easily microwaved back to the station, or which occur unexpectedly and do not allow time to



VIDEOTAPE recorder (console model) records full hour program on a single reel of magnetic tape.

make other arrangements. Taped commercials, too, can be changed within minutes of air time with little or no additional cost.

At present the Recorder cannot achieve the quality attained by commercial motion pictures. It has been suggested, however, that as refinements are achieved in this direction that the Electronicam system, or some similar arrangement, be teamed up with the Videotape machine to replace film techniques now used in Hollywood. Research is also going forward to adapt the device to successful color TV recording.

No tape duplicator device has been manufactured thus far, but this facility will be produced as the demand grows, and could conceivably replace the use of duplicate motion picture film prints, and projectors as we now know them.

Five prototype machines have been allotted to CBS and three prototype recorders to NBC at a cost of \$75,000 per unit. However, production schedules for more than 100 units have been set, with delivery of the first production units slated for February 1957. These latter recorders have been priced at

Continued on page 30



● NATIONAL BROADCASTING COMPANY, has announced through President Robert W. Sarnoff that NBC in 1957 will provide the first live programming ever to be produced expressly for educational television stations on a national basis.

"It is NBC's plan, during 1957," Mr. Sarnoff said, "to furnish specialized educational programs to all of the nation's non-commercial educational stations. These programs will be produced in our studios and furnished live to the educational stations over our network lines."

The NBC President said the programming service will be provided at no charge to educational stations. NBC has committed more than \$300,000 for programs, production facilities and personnel in connection with the 1957 project. He also announced that the Educational Television and Radio Center at Ann Arbor, Michigan, which has received funds from the Ford Foundation, is supplying the local loops to connect the educational stations with NBC network lines and is consulting closely with NBC on the design of the programs.

"These programs will be tele-

cast during an afternoon time period which does not conflict with our regular schedule," he declared. "They will also be kinescoped for repeat broadcast or subsequent classroom use, thus creating an important and enduring educational television library."

● MR. SARNOFF said that the educational programs to be provided by NBC next year will consist of three half-hour presentations each week with instruction in mathematics, the humanities and government. The project will extend through 26 weeks in 1957, beginning in March for 13 weeks, and resuming in October for another 13-week period. Each of the three program series will be conducted by experts in the field; James R. Newman, author and editor of "The World of Mathematics," already has agreed to supervise the mathematics course.

"We see our 26-week project as a demonstration operation," Mr. Sarnoff said. "We believe that when our project terminates at the end of 1957, its values and lessons can be carried forward in ways that will help enrich the whole future of education by television."

- NAEB PRESIDENT Burton Paulu is the author of a book recently published by the University of Minnesota Press, *British Broadcasting: Radio and Television In the United Kingdom*. Dr. Paulu who is manager of the University of Minnesota radio station, KUOM, did the basic research for the book as a Fulbright scholar in London in 1953-54.

• • •

- A 20TH ANNIVERSARY was celebrated by WQXR, New York, December 3. The first radio station to specialize in the presentation of classical music and news now has an audience numbering 885,000 families in the New York metropolitan area alone.

On the air 19 hours a day, WQXR offers symphonies, experimental compositions, operas, chamber music, vocals, operettas, show tunes, and a weekly jazz session. The last was begun in 1954 to give listeners a better understanding of a characteristically American art form.

Mrs. Helen Straus is program director.

• • •

- A SEMINAR-WORKSHOP on World Affairs Programs on Radio-TV will be conducted by the Social Science Foundation and the School of Communication Arts, University of Denver, June 24 to August 23, 1957. Some all-expense fellowships are offered for the

nine-weeks course. Those interested may ask for further information of The Director, Social Science Foundation, University of Denver, Denver 10, Colorado. Deadline for applications and supporting papers is March 1, 1957.

• • •

- SERIES BEGUN recently by WQED, Pittsburgh, include "RX-TLC" — the story of nursing, "Shakespeare on TV," and "The Humanities."

The nursing series is given by Sister Sara Marie Healy, instructor in nursing at Mount Mercy and will consist of seven programs.

Returned to the station by popular demand is Dr. Frank Baxter who will discuss "Romeo and Juliet," "Richard II," "Twelfth Night," and "King Lear."

The 13 half-hour humanities programs will deal with modern drama, short stories, poetry, novels, modern art, music, and an overall view of these arts of today.

• • •

- WQED'S *Schooltime* begins a kinescope series entitled *1040-A*. Presented by the Internal Revenue Service to Instruct employed high school students in filling out tax forms, it explains our tax system and the expenditure of the budget dollar to them (as well as to the general public). *1040-A* will be a supplement to the mathematics and Problems of Democracy segment of the school curriculum.

- GRANTS-IN-AID totaling \$44,920 for educational radio programs have been awarded by the Educational Television and Radio Center upon the recommendation of NAEB.

Receiving the grants are the University of Wisconsin, Madison; San Bernardino Valley College, San Bernardino, California; Florida State University, Tallahassee; University of Minnesota, Minneapolis; the University of Michigan, Ann Arbor; Lowell Institute Cooperative Broadcasting Council, Boston, Massachusetts; and the Pacifica Foundation, Berkeley, California.

Radio programs which will be developed under the grant cover a wide range of subjects from a sociological study of American women to an exploration of Sigmund Freud's theories and writings.

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- APPOINTMENT of Nobel laureate Dr. Glenn T. Seaborg as senior adviser in the sciences for the Educational Television and Radio Center has been announced recently by Dr. H. K. Newburn, president of the Center.

The University of California professor of chemistry and chemical engineering is "star" of the NET series, "The Elements."

● ● ●

- TYPEWRITING may be taught more effectively by television than by an instructor in the classroom, according to results of a study by the Bureau of Business Research

at Michigan State University. In the experiment, conducted by William R. Pasewark, it was found that TV-taught students not only learned to type faster but also made fewer errors than students taught by the conventional classroom method.

● ● ●

- TODAY'S CAREERS is a Fairleigh Dickinson University (Rutherford and Teaneck, New Jersey) series devoted to giving information on various fields of endeavor. Discussions are by leading figures in the fields.

● ● ●

- A RECENTLY revised list of educational radio and television stations has been sent to each station by the U. S. Department of Health, Education, and Welfare. Mrs. Gertrude G. Broderick, Radio-TV Education Specialist, who prepared the list says that additional copies are available on request to the department, Washington 25, D. C.

● ● ●

- EDUCATIONAL, CULTURAL and civic institutions or organizations planning a television workshop as a first step preparatory to the production of programs for television have available an excellent publication for use in preliminary planning. The writer refers to a publication of the National Social Welfare Assembly entitled, *Case History of a Television Production*

Workshop for National Agency Staff Members.

The publication is a session-by-session report of what actually took place during the two-day period of the Workshop, June 13-14, 1956, when 24 representatives of national organizations became students to learn all they possibly could in that short period about producing television programs. The teachers were drawn from networks, stations, institutions, and agencies in New York. The facilities used

were those of New York University.

This 26-page mimeographed document costs 25 cents and can be secured by writing to the Assembly at 345 East 46 Street, New York 17.—Tracy F. Tyler.

• • •

● DEPARTMENT OF rectification: cutline on page 26, January issue, should properly locate station KSLH in St. Louis not Denver.

Music Programming

Continued from page 18

them in that order. This is not an iron-clad rule, but in general the chronological idea is a good one.

After you have your compositions selected, you will probably want to write some program notes. These should be as clear and understandable and non-technical as possible. It's best to make these comments fairly short, and always interesting. Of course, you should see to it that all names are pronounced with the utmost care and accuracy. Faulty pronunciation can ruin a music program. There are written pronunciation guides which you can buy, and there's also at least one disc on the market that gives verbal pronunciations of composers' names and compositions.

It's a good idea to have a book

or two around that will give you background information on music and musicians. Baker's *Dictionary of Music* is a good one, as is Thompson's *Encyclopedia of Music and Musicians*.

Once you begin collecting your own LP's, you have the problem of filing them. We have found that the simplest way for us is to take the records from their original jackets and put them into plain brown record sleeves. We number the records (and sleeves) consecutively, and file them without regard for composers' names, titles, record companies, and such. All this latter information is put on cards and filed under several cross-indexes in small file drawers. If we want to find a specific record, we go to

these cards for the record sleeve number. We find that our system has worked very well over the years.

What about the original jackets that the records came in? We want the information on the back of the jackets, but we don't have filing space for the whole thing. At WUOM, we've devised a method of soaking off the back page of the jacket, the page with the information on it, drying this page, and filing it in our large folders on each composer. If we'd filed all the original jackets we would have been forced out of the music library long ago for lack of space. As it is now, our sheets occupy one business-size metal file cabinet.

After you've established operation, you need continuous ideas for putting selections together. For instance, you might on occasion want to have an all-Mozart program, or an all twentieth century program, or an all-American program. These are just gimmicks to hang programs on—but they're nice gimmicks. Or you might want an all-Heifetz program, or a program of only "recent releases." Often, these gimmick-type programs are more fun to do and more fun to listen to than a program with no central idea. Occasionally we've had programs of only *ballet* music, or only *folk* music, or only *flute* music. It's sometimes fun to let your imagination go. Right now I'm working on a rather extensive series of programs on *Swedish* music. A few months ago, we had a series on *Japanese* music. I might add, parenthetically,

that we carry music programs produced by the British Broadcasting Corporation, the French Broadcasting System, Radio Italiana, Radio Nederland, and the Association of German Broadcasters.

In closing, I'd like to return to the thought with which I began: that it's up to us, as educational broadcasters, to *maintain* and whenever possible, to *raise* the standards of our programs. In general, radio programs on the commercial networks have deteriorated steadily. Writing about this in the *New York Herald Tribune*, John Crosby has said: "I feel that it is immoral to put shoddy programs on the air deliberately. The striving downward in radio has reached into programs in insidious ways. There is the comedian who throws out a joke because he feels it a little too elevated for his audience, the quizzes which degenerated from "Information, Please," to a level of idiocy, the selection of dramas of the lowest common denominator. This imperceptible cheapening of programs did not go unnoticed by the listeners. The average listener may not be a coherent critic in the sense that he can put his finger exactly on what is wrong, but he is a very good critic in the sense he knows something is wrong. He may not be driven away from the program, but the intensity of his satisfaction in it is sharply reduced."

I'd suggest that all of us make an earnest effort to present radio programs that are going to bring a real, and, if possible, a lasting satisfaction to our listeners.

Book Reviews

Continued from page 8

zontal deflection circuits are explained.

In the chapter on commercial cameras the operational and adjustment procedures of the Dage system are given as well as that for the RCA TV Eye Camera and control unit. There is also a brief treatment of light, basic optics and lenses. The features and specifications of the Kay Lab system are also included.

The final chapter gives details for constructing an experimental closed circuit camera employing the 5527 iconoscope camera tube. The author states that this camera may be built at a cost of a few hundred dollars

including the camera tube which costs \$150. The camera, video amplifier, and modulator-oscillator are built in a 15x7x3 inch chassis which is mounted above a similar chassis containing the pulse and power generator, making the complete unit 15x7x12. A standard television receiver is used as a monitor.

For its size the book contains a great deal of technical information. It should prove worth while as a reference book, as well as providing much useful information for technicians serving the equipment. — CECIL S. BIDLACK, *NAEB TV Engineer*.

Quotations From -

TELEVISION IN THE MAKING, *edited by Paul Rotha, Hastings House, New York, 1956.*

"Video-tape, they say, can be played back almost immediately . . . Once again it is in the service of speed and intimacy, slashing the time for thought and skill . . . Perhaps television will, by cutting out the middle-man, by piping its product direct to the viewer, find more opportunity for the creative artist

who has been so frustrated in the cinema? Perhaps we may see ahead the day when, by providing the lowest possible kind of entertainment, television will allow the film to grow to adulthood?" (Introduction, page 20)

From the Chapter "Television for Children" by Michael Westmore

(BBC Producer of Children's Programs):

"Before (radio) (parents) were to their children the interpreters of the world and the unquestioned arbiters of taste. (Now, television) places the people behind the sets . . . in the studios . . . in a position of great responsibility because, however unimportant the individual programme may seem to them, the impact on their audience is tremendous and the possible results incalculable. I say 'however unimportant' because, in the hurlyburly of television production, it is sometimes very difficult to remember these facts. For people working in television the fact that the programme goes on at all is often such a miracle that the end product is forgotten. I do not defend this state of affairs but must recognize its existence." (Pp. 83-84)

From the Chapter: Criticism in Television," by Peter Black (TV and radio critic, London *Daily Mail*)

"I suggested earlier that the television critic has consolations for his lonely and peculiar life. It is true that, compared with his colleagues of the theatre and cinema, he appears to have little influence and less power. But the job of a critic does not end with these. There

is also the obligation to reflect, sustain, and increase interest in whatever medium he is writing about. It must be obvious that here the television critic can have great potential influence . . . The opportunities open to a television critic are in direct proportion to the enormous public interest in television. To argue that, because television programmes are fleeting, criticism is useless, is to pick up the stick by the wrong end. It is because television is fleeting that criticism is so important . . . It is important that programme producers, who are working for the public, should have their work acknowledged. . . . The obligation to be constructive is pressing. Critics of other entertainment are recommending their readers to buy it or to leave it alone . . . The television critic has to go further and describe how, in his opinion, a programme could have been made better . . . There are two ways for a critic to keep on friendly terms with the readers who pay his salary. The dangerous way is to try to get inside their minds and flatter their judgment by agreeing with it. The other, and safer, is to pay them the compliment of honest thought . . ." Pp. 168-170—H. J. SKORNIA, NAEB Executive Director.

UNTIL COMPLETION of its new sanctuary, Shiloh Congregational Church in Dayton, Ohio is using a closed TV circuit to enable overflow crowds in a church parlor and near-by hall to see and hear its Sunday services.

—*The Christian Century*

Low Power TV

Continued from page 7

higher gain antenna for use with the 100-watt transmitter, or by purchasing a 500-watt transmitter for use with the original antenna.

Based on the best information available at this writing, the latter approach would be more economical, and would at the same time provide better "fill-in" coverage in areas not in a direct line of sight from the transmitting antenna.

It is estimated that this substitution of a 500-watt for a 100-watt transmitter would not increase the cost of the total station installation by more than \$3,000. At the same time there would be a nominal increase in the operational expense because of additional power consumption and increased tube replacement costs.

On a comparative basis, the population served by the 100-watt and 500-watt station were determined to be as follows:

100 WATTS

Within Grade A	47,865
Within Grade B	22,441
Total served	70,306

500 WATTS

Within Grade A	55,932
Within Grade B	26,796
Total served	82,728

Although these population figures

do not compare favorably with those of commercial TV stations, they are definitely encouraging, and certainly large enough to justify the existence of the educational station.

• IN CONCLUSION, the advent of low-power telecasting equipment offers educators an unusual opportunity to construct and operate their own educational TV station for a surprisingly modest original investment, a figure comparable with the cost of a modern, well-equipped classroom. At the same time, since the transmitter and accessory equipment use comparatively inexpensive tubes operated at conservative voltages and currents, operational costs are only moderately higher than those of a standard educational FM broadcast station.

Certainly America's educators should be giving immediate consideration to the construction and operation of such a low-power station on their locally reserved channel. Once the station is on the air and the staff trained, attention can be given to improving the studio facilities, expanding the program schedule, and extending the station's coverage through increased power. Meanwhile, education has staked its claim to one more of those invaluable television channels.

Teachers, TV

Continued from page 13

not far from taking the time to decide whether what he watches is worth his time at all. A cooperative newsdealer in Lansing, Michigan made it possible for me to sell *TV Guide* at cut rates to my students. This was a bargain for both me and them. They liked the savings; I was happy to see them become selective in their televiwing. They surprise you with their ability to distinguish the first-rate from the phoney. As long as TV has its peaks of achievement, there is little cause to panic about the many dreary valleys in between. For if we can get our students excited about climbing those peaks, producers may be surprised in a generation at how empty the many valleys have become.

Taped TV

Continued from page 21

\$45,000 each, and estimates have been made that cost might be reduced to as little as \$25,000 within several years. Videotape Recorders will be available in the console model, weighing 1100 pounds, or in a rack mounting adaptation, weigh-

ing 1250 pounds.

As soon as the price is reduced due to increased production and sales, educational institutions will find the Videotape Recorder the real answer to the bottleneck of in-school televiwing. Live programs can be taped and distributed via closed-circuit systems at times compatible with the class schedules. Telecourses can be handled in the same way, and scores of additional applications will suggest themselves in all fields of instruction.

Consistency

Continued from page 9

subject matter areas not presently served by programs.

4) They should become familiar with current programs of all types so as to be better informed as to program availabilities with the end in view of preparing their students to be more discriminating listeners and viewers.

5) They should encourage individual parents and groups interested in child development to use every legitimate means which will result in better commercial radio and television programs.

The writer knows that many teachers have already accepted their obligations with respect to radio and television. May the number of such dedicated teachers grow until it includes the entire profession!—
TRACY F. TYLER, *Editor*.

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